

ZOOLOGY.—*A revision of the recent genera of the crinoid family Bourgueticrinidae, with the description of a new genus.*¹
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Of all the families of stalked crinoids represented in the recent seas the Bourgueticrinidae is the most universally distributed, occurring in all the oceans and ranging from 112 meters (62 fathoms) or less to a depth of 4842 meters (2690 fathoms), the greatest depth at which stalked crinoids have been found.

The genus *Metacrinus*, now dominant in the East Indies and ranging from southern Australia and Tasmania to southern Japan, includes about 25 species; but aside from this genus the Bourgueticrinidae with its 30 species is more numerous represented than all the other stalked families together.

Heretofore the recent species of Bourgueticrinidae have been grouped in two genera, *Rhizocrinus* and *Bathycrinus*, though it has long been evident that such a disposition was far from satisfactory; especially has this been the case since the discovery of the species of *Monachocrinus*, which have the general appearance of the species of one of the genera (*Bathycrinus*), but the detailed structure of those of the other (*Rhizocrinus*).

The recent species of the Bourgueticrinidae fall into six natural groups, which are differentiated as shown in the following key:

Key to the Recent Genera belonging to the Family Bourgueticrinidae

*a*¹ The third, sixth, and ninth brachials (the fifth, eighth, and eleventh ossicles from the radials) have a muscular articulation on either end; basals always fused into a solid ring which is broader than long, cylindrical or short truncated-conical; ten arms

*b*¹ The distal edges of the brachials are produced, overlapping the bases of the succeeding brachials, so that the dorsal profile of the arms is serrate; the IBr_2 (axillary) is markedly broader than long, distinctly shorter than the IBr_1

Bathycrinus.

*b*² The distal edges of the brachials are not produced, so that the dorsal profile of the arms is smooth; the IBr_2 (axillary) is little, if any, broader than long, and is about as long as the IBr_1

Ilycrinus.

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*a*² All the post-radial ossicles are united in pairs by non-muscular articulation; the basals are separate, or are fused into a solid ring which is truncated conical, always longer than broad

*b*¹ Ten (or twelve) arms, the second post-radial ossicle being axillary

Monachocrinus.

*b*² Five undivided arms

*c*¹ No sutures visible between the basals; the basals are solidly welded into a single conical ossicle

Rhizocrinus.

*c*² Basals always separated by distinct sutures

*d*¹ Column comparatively slender, the longer columnals being at least twice as long as broad; calyx distinctly conical

Bythocrinus.

*d*² Column very stout, the longer columnals being but little longer than broad; calyx nearly or quite cylindrical

Democrinus.

.Bathycrinus Wyville Thomson.

Bathycrinus WYVILLE THOMSON, Proc. Roy. Soc. Edinburgh, **7**, 1872, p. 772 (genotype *B. gracilis*, sp. nov.).

Geographical Range.—Mid-equatorial Atlantic and northwestward to the coast of Virginia and Maryland (as far as 38° 20' N. lat.), and northward to the latitude of the northern part of the Bay of Biscay (47° 38' N. lat.); eastern part of the Bay of Bengal, east of the northern end of Sumatra; mid-Pacific between Oceania and America (from 0° 3'.4 to 9° 57' N. lat.).

Bathymetrical Range.—From 1629 to 4842 meters (905 to 2690 fathoms).

Thermal Range.—From 34°3 to 36°8 Fahr. (all but one of the records are between 36°5 and 36°8).

Included Species.—*Bathycrinus aldrichianus* Wyville Thomson, *Bathycrinus equatorialis* A. H. Clark, *Bathycrinus gracilis* Wyville Thomson, *Bathycrinus pacificus* A. H. Clark, *Bathycrinus serratus* A. H. Clark, *Bathycrinus sibogae* A. H. Clark, and *Bathycrinus woodmasoni* A. H. Clark.

Ilycrinus Danielssen and Koren.

Ilycrinus DANIELSSEN and KOREN, Nyt Magazin for Naturvidenskaberne, **23**, 1877, 3 die Hefte, p. 45 (genotype *I. carpenterii*, sp. nov.)

Pterocrinus (Wyville Thomson, MS.) P. H. CARPENTER, "Challenger" Reports, Zoology, **11**, 1884, p. 242, 243 (genotype *Bathycrinus aldrichianus* P. H. Carpenter, 1884 [not of Wyville Thomson, 1878] = *Bathycrinus australis* A. H. Clark, 1907).

Geographical Range.—Antarctic regions, from west of the Crozet Islands to Enderby Land; extreme north Pacific from the Commander

Islands to between Sitka and the Columbia River; the cold deep water between Norway and Iceland, and northward.

Bathymetrical Range.—From 1337 to 4636 meters (743 to 2575 fathoms).

Thermal Range.—From 30°9 Fahr. and -1°6C. to 36°6. Fahr.

Included Species.—*Ilycrinus australis* (A. H. Clark), *Ilycrinus carpenterii* Danielssen and Koren, and *Ilycrinus complanatus* (A. H. Clark).

Monachocrinus, gen. nov.

Monachocrinus A. H. CLARK, Eastman's translation of Zittel's Palaeontology, 1913, p. 230.—A. H. CLARK, Internationale Revue gesamten Hydrobiologie und Hydrographie, 1914, p. 7.—A. H. CLARK, Die Crinoiden der Antarktis; 1915, pp. 125, 152, 182.—A. H. CLARK, Amer. Journ. Sci. and Arts, 40, 1915, p. 61. A. H. CLARK, Smiths. Miscell. Coll., 65, 1915, No. 10, p. 11.—A. H. CLARK, Amer. Naturalist 49, 1915, pp. 525, 526, 527, 542.

Diagnosis.—A genus of Bourgueticrinidae in which the arms divide once, on the second post-radial ossicle (being ten or twelve in number); all the post-radial ossicles are united in pairs by nonmuseular articulation; and the basals are separate, or are fused into a solid ring which is truncated conical, always longer than broad.

Geographical Range.—Caribbean Sea to the Azores and Morocco, and northwestward to southwest of Iceland; the Bay of Bengal; the vicinity of Banda and Célebes.

Bathymetrical Range.—From 1236 to 4255 meters (687 to 2419 fathoms).

Thermal Range.—The only two records, both in the Atlantic, are 3°0C. and 40°0 Fahr.

Included Species.—*Monachocrinus caribbeus* (A. H. Clark), *Monachocrinus minimus* (Döderlein), *Monachocrinus paradoxus* (A. H. Clark), *Monachocrinus perrieri* (Kœhler and Vanev), *Monachocrinus poculum* (Döderlein), *Monachocrinus recuperatus* (Perrier), and *Monachocrinus sexradiatus*, sp. nov.

Genotype.—*Monachocrinus sexradiatus*, sp. nov.

Monachocrinus sexradiatus, sp. nov.

Description.—The basals are anchylosed into a solid funnel-shaped ring which is rather more than twice as long as broad basally. In lateral view the sides of this funnel are almost parallel in the proximal half, but in the distal half they gradually diverge so that their final direction in relation to each other is the same as that of the two sides of the radial circlet, with which they merge without any deflection.

The radial funnel is composed of six similar radials of equal size, and is about twice as high as broad at the base; in profile it is seen to

be very slightly, almost imperceptibly, concave in the proximal half, becoming slightly convex in the distal; though the proximal end of the radial funnel is circular in outline, each radial distally gradually becomes convex dorsally so that in a dorsal view the distal end appears in outline as a hexagon, with rounded angles; the distance from the summit of the column to the distal edge of the radial circlet is 2 mm.

The IBr_1 are very long, about twice as long as the proximal width, with straight, slightly and regularly diverging sides.

The IBr_2 (axillaries) are little more than half as long as the IBr_1 , considerably broader than long, with a blunt distal angle.

Both the ossicles of the IBr series have a low obscure broadly rounded median convexity, carrying forward the convexity of the distal portion of the radials, and sharp straight sides; the IBr_2 has a shallow pit just within the blunt distal angle.

The twelve arms are slender and narrow, with a smooth dorsal profile, the distal borders of the brachials not being produced, and measure 28 mm. in length from the distal edge of the radials; the brachials are all united in pairs by non-muscular articulations; the first brachial is slightly trapezoidal, longer outwardly than inwardly, broader basally than distally, half again as long as broad distally; the second brachial is not much more than half as large.

The first pinnule occurs on from the tenth to the fourteenth brachial, usually on the tenth.

The portion of the column attached to the crown is 22 mm. in length and consists of forty-three segments, of which the first fifteen are short and discoidal and the six following broader than long; the last five or six segments of the column as preserved are about four times as long as broad with very slightly, almost imperceptibly, enlarged ends, and a similarly almost imperceptible median raised girdle.

Another specimen, with the arms 25 mm. long, differs in having the five basals, which are of unequal size, separated from each other by sutures.

Locality.—Southwest of Iceland ($61^{\circ} 44'$ N. lat., $30^{\circ} 29'$ W. long.).

Depth.—1135 fathoms.

Bottom temperature.— $3^{\circ}C$.

Rhizocrinus M. Sars.

Rhizocrinus M. Sars, Forhandl. Vidensk. Selsk., 1864, p. 127 (genotype *Rh. lofotensis*, sp. nov.).

Geographical Range.—North Atlantic only; from northern Florida to Iceland, Ireland, and Norway, reaching to about $68^{\circ}5$ N. lat. on the Scandinavian coast.

Bathymetrical Range.—From 140 to 2340 meters (77 to 1300 fathoms).

Thermal Range.—From $0^{\circ}1C$. to $8^{\circ}4C$. and $48^{\circ}7$ Fahr.

Included Species.—*Rhizocrinus lofotensis* M. Sars, and *Rhizocrinus verrilli* A. H. Clark.

Bythocrinus Döderlein.

Bythocrinus DÖDERLEIN, Wiss. Ergeb. der deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia" 1898-1899, **17**, 1912, Heft 1, p. 11 (genotype *Rhizocrinus* [*Bythocrinus*] *chuni* or *Rh.* [*B.*] *braueri*, spp. nov.).

Geographical Range.—East Indies, and eastward to the northeastern coast of Africa; Atlantic coasts of northwestern Africa and southwestern Europe; Gulf of Mexico, and southward at least to Ceará, Brazil.

Bathymetrical Range.—From 158 to 1668 meters (88 to 927 fathoms).

Thermal Range.—The records are 3°8 and 4°6C., and 40°5 Fahr.

Included Species.—*Bythocrinus braueri* Döderlein, *Bythocrinus brevis* (A. H. Clark), *Bythocrinus chuni* Döderlein, *Bythocrinus conifer* (A. H. Clark), *Bythocrinus intermedius* A. H. Clark, *Bythocrinus nodipes* (Döderlein), and *Bythocrinus robustus* (A. H. Clark).

Democrinus Perrier.

Democrinus PERRIER, Comptes rendus, **96**, 1883, No. 7, p. 450 (genotype *D. parfaiti*, sp. nov.).

Geological Range.—First found in a breccia containing a human skeleton at Guadeloupe, French West Indies; otherwise only known from the recent seas.

Geographical Range.—From Sulu (Joló) to Ceram Laut and Timor; near Krakatoa; coast of Morocco; Caribbean Sea and Gulf of Mexico.

Bathymetrical Range.—From 112 to 2050 meters (62 to 1139 fathoms).

Thermal Range.—No records.

Included Species.—*Democrinus parfaiti* Perrier, *Democrinus rawsonii* (Pourtalès), *Democrinus sabae* (A. H. Clark), and *Democrinus weberi* (Döderlein).

There are in the literature many records referring to species of this genus which are undeterminable.